1. Introduction

The Department of the Navy (DON) Information Technology Standards Guidance (ITSG) identifies the standards and provides the guidance for applying information technology toward the creation and sustainment of a responsive, and user-friendly, information management environment. All commands in the Navy and Marine Corps are required to consider the standards and guidance herein to maximize interoperability and focused information support.

As a guide, each chapter will begin with the following map (Figure 1-1) and a description of its relationship to the rest of the document. This chapter, for example, provides the background, purpose, and outline of the ITSG.

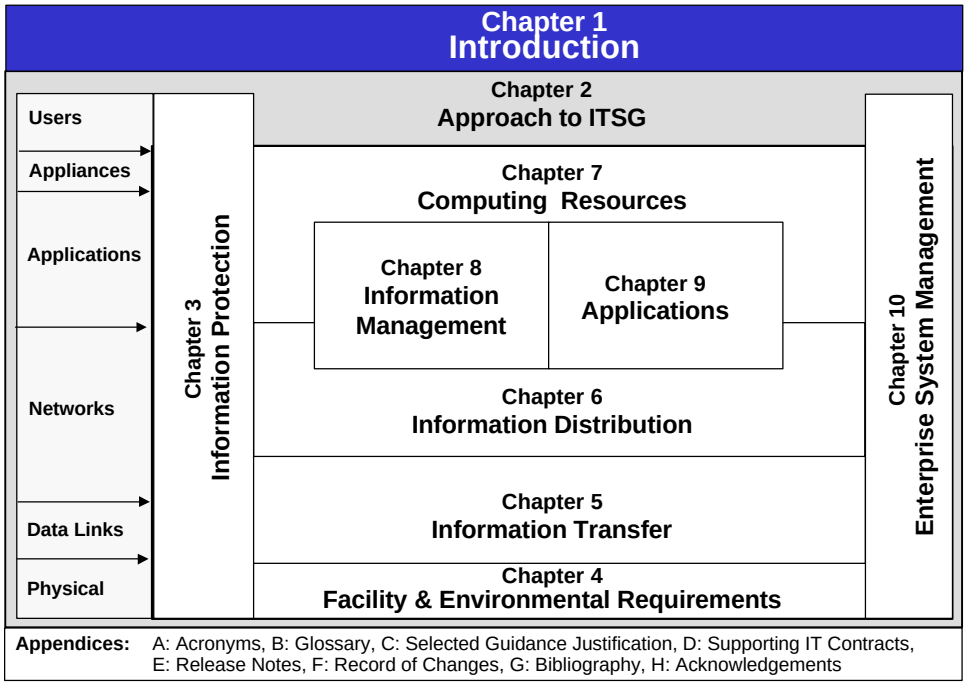

Figure 1-1. ITSG Document Map Highlighting Chapter 1, Introduction

1.1 Background

In the past, our individual commanders in the Department of the Navy (at every level of the organization) built information infrastructures that supported their individual missions. These independent efforts produced a myriad of locally effective solutions. Fleet and Marine Corps concentration areas had a proliferation of communications networks, many in close proximity but each one completely isolated. Functional mission commanders deployed multiple systems often with separate, dedicated transmission systems. Weapon systems on our ships each had their own sensor system and a separate communications system to send data back to the shooter. Our networks were “stovepiped” – they were neither inter-connected nor interoperable.

Joint Vision 2010 states “the unqualified importance of access to information through improvements in the speed and accuracy of transferring data.” The Chief of Naval Operations stated that “interactive connectivity will be required at all levels of the chain of command.” The Commandant of the Marine Corps stated “we must reach and execute effective military decisions

faster than our adversaries through a command and control system that is flexible and adaptable." A Fleet Commander in Chief stated that "a robust information infrastructure and information dissemination to dispersed forces are key elements in achieving information superiority."

The Secretary of the Navy established the position of the Department of the Navy's (DON) Chief Information Officer (CIO) to develop and implement a comprehensive information infrastructure that supports the Naval mission within the Defense Information Infrastructure (DII). A strategy for introducing, fostering and maintaining an effective information technology (IT) environment, as well as integrating and managing information systems, including the information itself, is critical to this endeavor. The goal is to provide complete and timely access to information through an infrastructure that provides interconnectivity, access to information, and tools that allow the Navy and Marine Corps to obtain a competitive advantage and increased productivity.

Providing the "right information to the right people at the right time" depends upon a complete information management construct – process improvement, data management and advanced information technology. All three must be focused on enterprise customers' requirements. The DON IT infrastructure must support interactive connectivity at all levels of the chain of command – national, theater, local, and unit. Our marines, sailors, and civilians must have seamless, robust, and secure access to information.

The Secretary of the Navy has delegated to the DON CIO the responsibility and authority to develop the policy, standards, guidance, and strategy necessary to create and sustain a living information infrastructure. This infrastructure must support the implementation of the DII within the highly dynamic environment that characterizes Naval operations. Unlike commercial industry where organizations and facilities are at fixed locations and the organizational staff is relatively stable, the Navy and Marine Corps environment involves:

- Entire organizations that move between satellite footprints, from sea to port, and from port to port on a routine basis
- Staffs that frequently deploy, embark, and split
- Information system support personnel who rotate biennually

The similarity between military organizations and commercial organizations, however, is that each must deal with changing information technology that causes rapid obsolescence of the infrastructure and allows adversaries or competitors to obtain an advantage. Information technology advancements also place a stress on enterprise interoperability as products are acquired from multiple vendors with advanced, but incompatible, features. The challenge of the DON CIO is to tap the dramatic advancements being made by commercial industry in information technology and guide their continual incorporation into the DON's dynamic and diverse enterprise operating environment.

1.1.1 Establishment of the ITSG

To meet this challenge, the approved DON CIO operational model is based on collaborative centralized planning and decentralized execution. The model creates and empowers a DON CIO Board of Representatives, chaired by the DON CIO, with membership from across the Navy and Marine Corps' operating forces, major claimants, and program sponsors. It establishes DON CIO Integrated Product Teams (IPTs), also with DON-wide presence, which develop enterprise

Information Management and Information Technology (IM/IT) plans, architecture, and standards for the Department.

A series of recent laws, including the Clinger-Cohen Act of 1996 (Public Law 104-106, 1996), require the DON CIO to "develop, maintain, and facilitate the implementation of a sound and integrated enterprise architecture and standards" (Section 5125 (b) (2)). To provide a focus for these efforts, the Secretary mandated that the DON CIO IPTs be the only authorized entities in the Department to develop enterprise IM/IT architecture and standards. All existing or similar efforts in the DON will be consolidated, aligned, or disestablished in order to provide the required focus and effectiveness of the DON CIO efforts.

During its first meeting in May of 1997, the DON CIO Board of Representatives determined IM/IT standards to be its top priority. The Board authorized the stand up of the DON Information Technology Standards Guidance IPT to select and publish a DON Information Technology Standards Guidance (ITSG) document.

This document results from the collaborative efforts of the DON IT Standards Guidance IPT. The IPT was formed using a skills-based approach and is comprised of DON military and civilian technical experts who represent specific IT areas. Each is a Subject Matter Expert (SME) for a particular information technology area and provides expertise, continuity, and accountability for the DON IT standards-related decisions in that area. This approach provides the DON with an improved ability to address the complex technical issues of IT specifications, standards, and operational interfaces.

1.2 Purpose, Scope and Applicability

The purpose of the DON ITSG is to provide specific complementary guidance to support the special IT requirements of Naval organizations complementary to the Joint Technical Architecture (JTA). It is to identify the full complement of best practices, standards and guidance that support full interoperability and seamless interconnectivity within the DON and with the DoD, Federal, and Public Domains. Specifically:

- To provide the foundation for integration, interconnection, and interoperability between and among all tactical, strategic, and sustaining base systems, in-garrison and deployed, ashore and afloat; that produce, use, or exchange information electronically.
- To provide information system security guidance that ensures Naval information system implementation meets DOD security policy.
- To promulgate standards and guidelines for system development and acquisition to significantly reduce lifecycle cost, shorten development and fielding time, and optimize the impact on program financial and execution performance.
- To introduce guidance for measuring the effectiveness and efficiency of the Naval enterprise information infrastructure.

The ITSG must be considered by all DON organizations for IT planning, acquisition, contracting, and operations. Within the ITSG, there are levels of adherence (and freedom) which provide appropriate latitude to meet operating environments and mission requirements while maintaining the goal of interoperability and security. These levels are discussed in Section 2.8. The ITSG applies to all systems that produce, use, or exchange information electronically, and is intended

for anyone involved in the management, development, acquisition and operation of new or improved systems.

1.3 Relationship to the JTA and DII COE

The ITSG complements the JTA and provides additional guidance towards applying the JTA and DII COE to all IT/IM-related systems in the DON. Where the ITSG conflicts with the JTA, the JTA supersedes the ITSG for those systems/interfaces that fall within the scope and applicability of the JTA.

1.4 Relationship to the DON IM/IT Strategic Plan

The DON IM/IT Strategic Plan emphasizes that sound DON information systems architecture and technology standards are essential toward improving Navy and Marine Corps functional mission performance, and promoting greater IT cost-effectiveness. The architecture provides the context to support the functional work processes, information flows, supporting IT systems and infrastructure. The standards provide the specifications and interfaces needed to interface components of the architecture. Together, the architecture and standards help support a DON corporate virtual information infrastructure within the DII to connect every DON IT user. This leads to a condition in which users are given access to common information and information tools empowering them to develop and incorporate new processes. The subsequent improvement in productivity and efficiency enables the "Revolution in Military Affairs" (RMA) and the "Revolution in Business Affairs" (RBA). (See the reference "Mazarr, U.S. Army War College" in Section 1.8 for a description of RMA.)

Principal strategic elements to be supported by the DON ITSG include the following:

- Network Centric Environment
- Client/Server Model of Computing
- Open System Standards
- Acquisition Improvement
- Support for Re-Invention

1.4.1 Network-Centric Environment

A network-centric strategy is an approach that both complements and promotes traditional client/server applications. The DII and the Internet provide significant business value to the DON by providing a ready-made infrastructure for network connectivity. It allows rapid sharing of information, dynamic applications deployment, and leveraged network operations. The Internet protocol suite has enabled the explosion of portable Internet applications.

The network centric strategy adapts and extends Internet technology and infrastructure to meet the DON needs by providing the following:

- Scaleable Internet technology – from room-sized to global networks.

- Leveraging of commercial technology.
- Shareable solutions – best practices solutions can be used DON-wide.
- Supporting “network-ready” systems and information sources early in their design.
- Recognition of diverse operating environments and contingencies
- Understandable basis for corporate direction.

1.4.2 Client/Server Model of Computing

Broken into its basic components, the client/server model includes the network, data servers, application servers, presentation clients, end systems, and associated interfaces. At the border of the network, regardless of its size, are the presentation clients and end systems. The presentation clients consist of personal workstations that include laptop and desktop personal computers (PCs) as well as video teleconferencing (VTC) equipment. End systems consist of the sensors (e.g., radar), communication devices (e.g., telephones), and action devices (e.g., machinery and weapons control) that attach to the network. For this model to perform in a standardized and scaleable fashion, the interfaces must satisfy two basic criteria:

- Data element standardization between the end systems.
- The interface between end systems and the network must be standardized.

The client/server model is generally characterized by the division of an application into components providing the capability for each component to run on different networked computers. This division of work permits components to be positioned to increase the reliability and agility needed for an integrated system to support multiple missions.

1.4.3 Open System Standards

Open system standards are embraced as the desired goal for the DON; however, there are many areas in IM/IT implementation that are not supported by such standards. Guidance, de facto standards, and best practices must be included in the ITSG to support full IT/IM architecture integration. Often there are multiple standards that apply to a single information function. This document presents all guiding elements needed for full information infrastructure integration.

1.4.4 Acquisition Improvement

Actual investments in information technology in the Navy and Marine Corps exceed $2 billion annually. IT investment decisions are made by program managers and unit commanding officers spending their own command budgets to implement independent IT solutions. It is not the intent here to mandate either central procurement activity or central oversight. However, DON commanders and program managers cannot simply develop independent IT acquisition plans, if a seamless, interoperable network is to be built.

For both affordability and innovation, the ITSG supports the use of commercial products in the acquisition process. The standards established in this document represent DON corporate guidance for making decentralized investment decisions about information technology products

and services. It can guide multiple programs and multiple commands to contribute to the larger Navy-Marine Corps enterprise IT solution.

1.4.5 Information Process Re-Invention

Every DON IM/IT process must directly link to and support the established DON mission, goals, and objectives. Information processes that are tied to strategic drivers — linked to critical missions and extensive resources – will receive greatest emphasis for re-invention. While process re-invention will be explored prior to application of IT, the leveraging effects of IT must be emphasized. These efforts, consistent with those described in Joint Vision 2010 and the Quadrennial Defense Review (QDR), will reduce cost while seeking RMA levels of return on investment (ROI). The DON must make the attendant investments in technology refreshment that involve replacing system components and retraining people. This includes introducing new methodologies to prevent or delay obsolescence and exploit new capabilities.

1.5 Use of the DON ITSG

Industry studies support the premise that a coherent corporate technology policy helps an enterprise realize up to 30 percent greater value in productivity, cost control, and decision making. It follows that a corporate information technology policy will also translate into more effective warfighting capability such as speed of command and information superiority needed for dominant maneuver, precision engagement, focused logistics, and full-dimension protection under the Joint Vision 2010 concept.

This document establishes DON guidance as a basis for making daily technology-related decisions across the enterprise, and for planning future system capabilities. As such, it is intended to guide and influence implementation plans. Individual command plans require IT solutions that best support their specific command needs. These plans should include the guidance from this document and a migration strategy that considers their existing information infrastructure.

As an aid to IM/IT planning, the DON ITSG guides the acquisition and development of systems to support new and emerging functionality and provides a target towards which existing systems will move. It is not a catalog of all information technology standards used within today's DON systems. Rather, it represents those standards, specifications, and practices that should be used now and in the future.

The ITSG contains no mandatory requirements and cannot be used as justification for less than full and open competitive acquisition. Purchasing agents and contracting officers continue to be responsible for appropriate source selection and price reasonableness decisions. The use of existing contractual instruments, which have already been competitively awarded, is encouraged because they greatly facilitate the ordering process. Refer to Appendix D of this document for information on available competitively awarded contracts.

This document is based upon a "snapshot" of the current state of technology. This information will be promulgated from the DON CIO Web site which will be frequently updated. The printed document cannot stay as current as the on-line version, but it offers greater portability. Periodic releases of this document will be published to maintain currency, along with release notes (to be reflected in Appendix E) that highlight significant changes. The description and location of specific changes, along with the associated rationale, will also be provided in Appendix F.

1.6 Document Organization

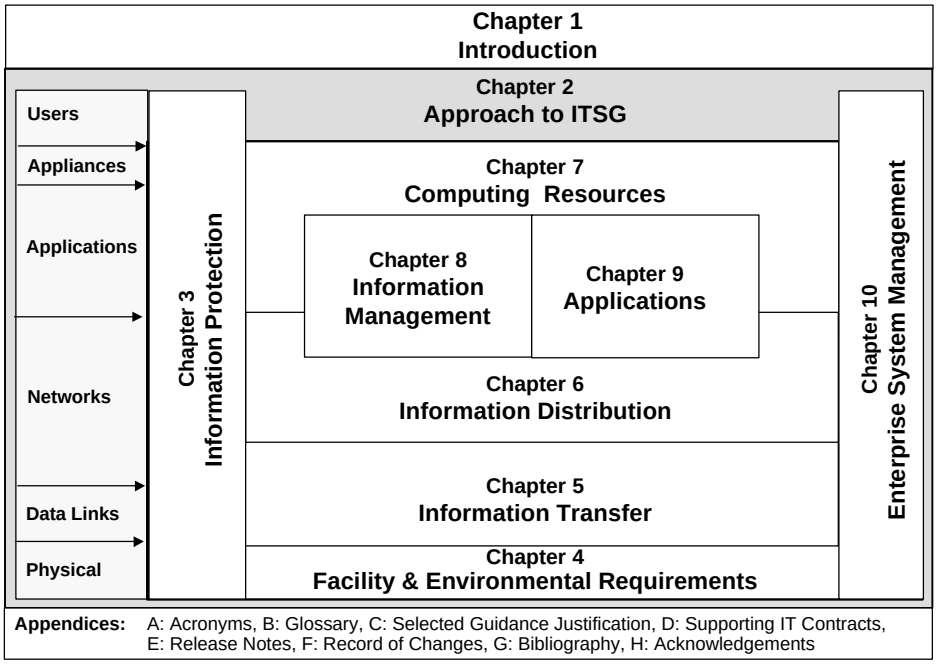

Figure 1-2. ITSG Document Map

Figure 1-2 is a document map of the ITSG which will be provided at the beginning of each chapter for perspective. As shown, this document consists of ten chapters and eight appendixes. The first two chapters provide the background, overview, and approach to establishing the ITSG:

Chapter 1 – Introduction provides the background, purpose, and outline of the document.

Chapter 2 – Approach to the ITSG provides the basis for the organization and selection of guidance.

The remaining eight chapters describe the standards and guidance for a sequence of technology areas:

Chapter 3 – Information Protection includes system and information security standards and guidance.

Chapter 4 – Facility and Environmental Requirements includes cabling, mechanical, and electrical standards and guidance.

Chapter 5 – Information Transfer includes network communication standards and guidance for local area networks, wide area networks, satellite communication networks, end-station connectivity and the internetworking protocols to link these together to form a single information infrastructure.

Chapter 6 – Information Distribution includes core network applications common to all users including electronic mail, web services, time services, file transfer, and directory services.

Chapter 7 – Computing Resources includes computers and associated operating systems, peripherals, and communication devices.

Chapter 8 – Information Management includes the format, structure, organization, and interchange of data within and between information bases.

Chapter 9 – Applications includes software programs that support business and operational applications. Also includes video teleconferencing (VTC) and telephony over data networks.

Chapter 10 – Enterprise Management includes systems management, organization, system monitoring and control, network management and proposed measures of effectiveness for the information infrastructure.

Within each of these chapters is a chapter overview, a description of each technology, and then the associated DON best practices, standards, and guidance including an expected time span of applicability. Each chapter also provides recommendations on how these standards and guidance should be applied to various platforms and facilities.

Eight appendices are provided to include: an acronym list (Appendix A), a glossary (Appendix B), selected guidance justification (Appendix C), supporting IT contracts (Appendix D), release notes (Appendix E), record of changes from the previous version (Appendix F), a bibliography/reference list (Appendix G) and acknowledgments (Appendix H).

1.7 Promulgation of IT Standards and Guidance

Figure 1-3 illustrates how each chapter is organized. As shown, there will be an overview that provides a summary of what is contained in the chapter. Some chapters will also have a background section to provide a foundation to understand the contents. Within the body of the chapter, topics will be introduced and discussed. An associated statement on the implementation of the standard, specification or guidance will be followed by a table showing the recommended implementation over time for different platforms and facilities. Each chapter will close with a list of references. The official references of the standards and guidance will be provided as well as any sources supporting the chapter.

Overview

Background

Topic

Description

Discussion

Best Practices

Recommended Implementation

	Current ITSG	Projected ITSG			
Not Recommended	**1999**	**2000**	**2001/2002**	**2003/2004**	**Emerging**
Avoid selecting any of these specifications, products, or technologies	Select specifications, products, or technologies based on this time line.				These specifications, products, or technologies are being monitored as potentially significant.
Facilities, Platforms, Operational Environments	The specifications, products or technologies above apply to these platforms or operational environments.				

Notes

References

Sources for Standards Guidance

Supporting Resources

Figure 1-3. Generic ITSG Chapter Outline

1.8 Changes to this Document

This document will be updated periodically by the DON IT Standards Guidance IPT. The process for submission and approval of changes is shown in Figure 1-4. Requirements and/or recommendations should be submitted in writing to the IPT by any organization. The IPT will obtain required input for evaluation, determine appropriate action and review, and provide the recommended action to the DON CIO Board of Representatives. Editorial and minor changes to the document will be approved by the IT Standards Guidance IPT; the Board will approve substantive changes. Following approval, promulgation will include appropriate media products with document management performed by the Office of the DON CIO Staff. Routine change requests will be aggregated and addressed in a semi-annual IPT forum; emergent requirements will be addressed by an electronic IPT and Board of Representatives process. Proposed changes should be provided to the Office of the DON CIO – Enterprise Architecture and Standards Competency. Changes will be presented to the DON IT Standards Guidance IPT for resolution.

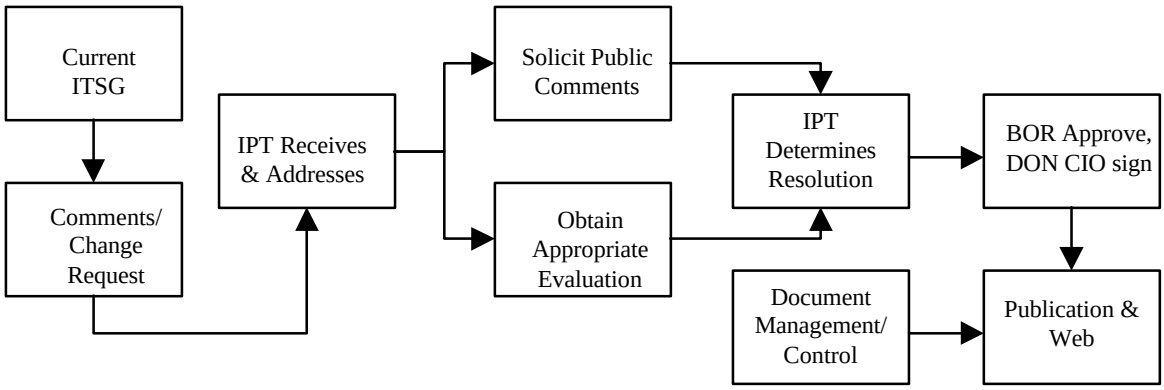

Figure 1-4. ITSG Change Process

The ITSG document will be published annually on CD-ROM to capture standards and guidance updates that have been selected by the IPT and approved by the DON CIO Board of Representatives during the year. Because this document promulgates the entire scope of standards and guidance, it runs the risk that significant portions will be obsolete by the time of publication. During the twelve months between updates, the currency of the printed document will further degrade. The primary source of the ITSG will be a web file that is reviewed and updated quarterly. The URL for the ITSG is www.doncio.navy.mil/itsgpublic.

1.9 Waiver of ITSG Compliance

Responsibility for compliance with this document rests with individual DON organizations. The process by which this is implemented is open to each organization's discretion. It is recommended that each acquisition process be certified by the organization CIO to ensure that contemplated items, services, or processes are in compliance with this document. It is recommended that exceptions be approved in writing by the organization CIO, commanding officer or equivalent. It is further recommended that these exceptions be forwarded to the ITSG IPT as input for further document changes based upon organizational user requirements. Such organization submissions should be forwarded to the DON CIO, Enterprise Architecture and Standards Competency.